

# CALCULUS I(DIFFERENTIAL CALCULATIONS)

|           |   |  |  |
|-----------|---|--|--|
| <b>1</b>  | Course Title:   | CALCULUS I(DIFFERENTIAL CALCULATIONS)  |  |
| <b>2</b>  | Course Code:  | MAT1081  |  |
| <b>3</b>  | Type of Course:   | Compulsory   |  |
| <b>4</b>  | Level of Course:  | First Cycle  |  |
| <b>5</b>  | Year of Study:  | 1  |  |
| <b>6</b>  | Semester:   | 1  |  |
| <b>7</b>  | ECTS Credits Allocated:                                 | 6.00   |  |
| <b>8</b>  | Theoretical (hour/week):                                | 3.00   |  |
| <b>9</b>  | Practice (hour/week):                                   | 2.00   |  |
| <b>10</b> | Laboratory (hour/week):                                 | 0  |  |
| <b>11</b> | Prerequisites:  | There are no prerequisites.  |  |
| <b>12</b> | Language:   | Turkish  |  |
| <b>13</b> | Mode of Delivery:                                       | Face to face   |  |
| <b>14</b> | Course Coordinator:                                     | Prof. Dr. ESEN İYİGÜN  |  |
| <b>15</b> | Course Lecturers:                                       | Prof.Dr.Kadri Arslan<br>Yrd.Doç.Dr.Sezayi Hızlıyel   |  |
| <b>16</b> | Contact information of the Course Coordinator:          | e-posta: esen@uludag.edu.tr<br>telefon: 0.224.2941766<br>adres: Uludağ Üniversitesi, Fen-Edebiyat Fakültesi, Matematik Bölümü, 16059, Görükle Kampüsü, Bursa   |  |
| <b>17</b> | Website:  |  |  |
| <b>18</b> | Objective of the Course:                                | To train students in understanding of numbers, inequalities, functions and powers. To provide experience in drawing the graph of a curves. To train students in understanding of derivative and rules of derivative. To give knowledge on compute limit. To train students in establishing mathematical modelling of some problems. To provide experience in some special functions. |  |
| <b>19</b> | Contribution of the Course to Professional Development: |  |  |
| <b>20</b> | Learning Outcomes:                                      |  |  |
|           |   | <b>1</b>   | Knows the corresponding mathematical models to bring up to date problems.Mathematics is a whole, is not the only solution of the problems you learn to reach different methods of solving the problem. |
|           |   | <b>2</b>   | Recognise numbers, inequalities and functions.   |
|           |   | <b>3</b>   | Learns in drawing the graph of a curve.  |
|           |   | <b>4</b>   | Learns derivative, limit and continuity.   |
|           |   | <b>5</b>   | Learns maximum and minimum problems, increasing and decreasing functions.  |
|           |   | <b>6</b>   | Learns indeterminate forms and differential.   |
|           |   | <b>7</b>   | Learn how to take the derivative of some special functions.  |
|           |   | <b>8</b>   |  |
|           |   | <b>9</b>   |  |
|           |   | <b>10</b>  |  |
| <b>21</b> | Course Content:   |  |  |
|           |   | <b>Course Content:</b>   |  |

| Week   | Theoretical   | Practice  |        |
|--|---|---|--------|
| 1  | Numbers and Inequalities  | Solved number and inequality examples.  |        |
| 2  | Functions   | Function examples given.  |        |
| 3  | Graphs  | Graphs were drawn.  |        |
| 4  | Curves and equations  | Examples of the curve and the equation is solved.   |        |
| 5  | Limit and Continuity  | Were given examples of limit and continuity.  |        |
| 6  | The derivative  | Examples of derivatives are solved.   |        |
| 7  | Higher derivatives and the chain rule   | Examples were given of higher order derivatives and the chain rule.   |        |
| 8  | Midterm Exam + Repeating courses  | Solving problems.   |        |
| 9  | Trigonometric functions, their graphs and properties  | Graphs were drawn of them by giving examples of trigonometric functions.  |        |
| 10   | The maximum and minimum problems, increasing and decreasing functions, the mean value theorem | Examples were given the maximum and minimum problems, increasing and decreasing function examples were solved and examples related to the mean value theorem.   |        |
| 11   | Indeterminate forms, Polar coordinates, Parametric curves                                     | Indeterminate forms, polar coordinates and parametric curves were given examples of.  |        |
| 12   | Differential, Curve sketching,  | Examples were given of differential and curve sketching.  |        |
| 13   | Hyperbolic and Inverse functions and their derivatives.                                       | Examples of derivatives of hyperbolic and inverse functions are solved.   |        |
| 14   | Exponents and Logarithm functions and their derivatives.                                      | Exponential and logarithmic functions derivatives examples were given.  |        |
| 22   | Textbooks, References and/or Other Materials:   | <p>1. Prof. Dr.Mustafa Balcı, 2003, Genel Matematik I, Balcı Yayınları, Cilt I, 2.Baskı, ISBN-975-6683-00-7, Ankara, 418 s.</p> <p>2. Serge Lang, 1980, A First Course in Calculus, Fourth Edition, ISBN 0-201-04148-0, Yale University, 524 s.</p> <p>3. H.Hilmi Hacısalihoğlu, Mustafa Balcı, Fikri Gökdağ, 1988, Temel ve Genel Matematik, Cilt I, 3. Baskı, Ankara, 678 s.</p> <p>4. Thomas Calculus, 11.Edition, Pearson Addison-Wesley Publishing Company -2005.</p> <p>5. James Stewart TÜBA YAYINLARI Kalkülüs Diferansiyel ve İntegral Hesap 2010. ISBN:9758593943</p> |        |
| 23   | Assesment   |   |        |
| TERM LEARNING ACTIVITIES   |   | NUMBER  | WEIGHT |
| Midterm Exam   |   | 1   | 40.00  |
| Quiz   |   | 0   | 0.00   |
| Home work-project  |   | 0   | 0.00   |
| Final Exam   |   | 1   | 60.00  |
| Total  |   | 2   | 100.00 |
| Contribution of Term (Year) Learning Activities to Success Grade |   | 40.00   |        |
| Contribution of Final Exam to Success Grade                      |   | 60.00   |        |
| Total  |   | 100.00  |        |
| Measurement and Evaluation Techniques Used in the Course         |   |   |        |
| 24   | <b>ECTS / WORK LOAD TABLE</b>   |   |        |

| Activites                  | Number | Duration (hour) | Total Work Load (hour) |
|----------------------------|--------|-----------------|------------------------|
| Theoretical                | 14     | 3.00            | 42.00                  |
| Practicals/Labs            | 14     | 2.00            | 28.00                  |
| Self study and preperation | 14     | 2.00            | 28.00                  |
| Homeworks                  | 0      | 0.00            | 0.00                   |
| Projects                   | 14     | 1.00            | 14.00                  |
| Field Studies              | 0      | 0.00            | 0.00                   |
| Midterm exams              | 1      | 10.00           | 10.00                  |
| Others                     | 14     | 3.00            | 42.00                  |
| Final Exams                | 1      | 16.00           | 16.00                  |
| Total Work Load            |        |                 | 180.00                 |
| Total work load/ 30 hr     |        |                 | 6.00                   |
| ECTS Credit of the Course  |        |                 | 6.00                   |

| 25  | CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS |     |     |              |     |     |                 |     |     |               |      |      |                    |      |      |      |
|---|---|-----|-----|--------------|-----|-----|-----------------|-----|-----|---------------|------|------|--------------------|------|------|------|
|   | PQ1   | PQ2 | PQ3 | PQ4          | PQ5 | PQ6 | PQ7             | PQ8 | PQ9 | PQ10          | PQ11 | PQ12 | PQ13               | PQ14 | PQ15 | PQ16 |
| ÖK1   | 0   | 4   | 4   | 0            | 4   | 0   | 0               | 0   | 3   | 0             | 0    | 0    | 0                  | 0    | 0    | 0    |
| ÖK2   | 0   | 4   | 4   | 0            | 3   | 0   | 0               | 0   | 0   | 0             | 0    | 0    | 0                  | 0    | 0    | 0    |
| ÖK3   | 0   | 0   | 0   | 4            | 0   | 3   | 0               | 0   | 0   | 3             | 0    | 0    | 0                  | 0    | 0    | 0    |
| ÖK4   | 0   | 4   | 0   | 0            | 0   | 0   | 0               | 0   | 0   | 0             | 0    | 0    | 0                  | 0    | 0    | 0    |
| ÖK5   | 0   | 4   | 0   | 4            | 0   | 0   | 0               | 0   | 0   | 0             | 0    | 0    | 0                  | 0    | 0    | 0    |
| ÖK6   | 0   | 4   | 0   | 4            | 0   | 0   | 0               | 0   | 0   | 0             | 0    | 0    | 0                  | 0    | 0    | 0    |
| ÖK7   | 0   | 4   | 0   | 0            | 0   | 0   | 0               | 0   | 0   | 0             | 0    | 0    | 0                  | 0    | 0    | 0    |
| <b>LO: Learning Objectives PQ: Program Qualifications</b> |   |     |     |              |     |     |                 |     |     |               |      |      |                    |      |      |      |
| <b>Contribution Level:</b>                                | <b>1 very low</b>   |     |     | <b>2 low</b> |     |     | <b>3 Medium</b> |     |     | <b>4 High</b> |      |      | <b>5 Very High</b> |      |      |      |